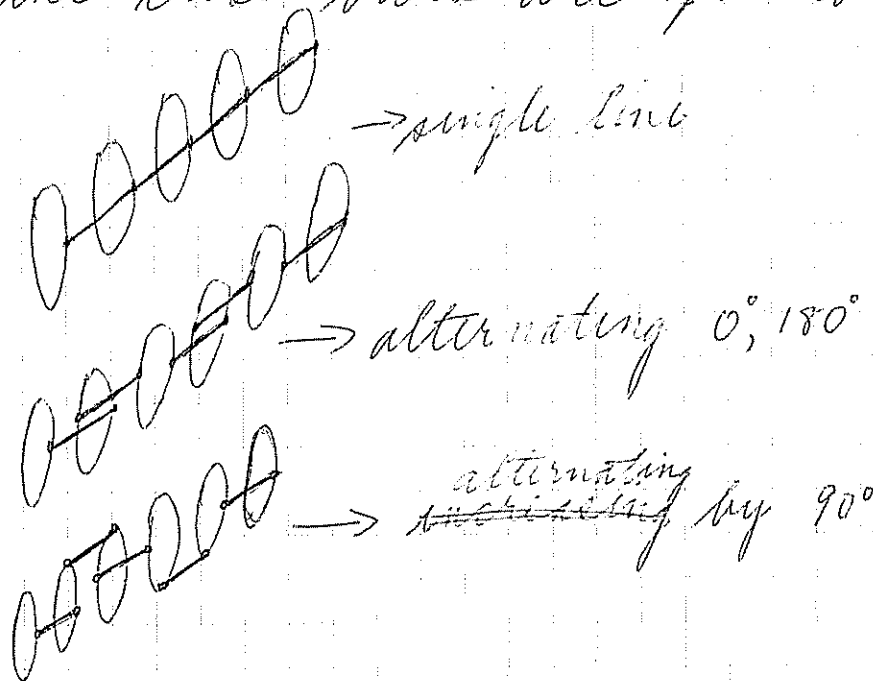


February
22, 1990Balloon Expandable Hoop and Stenting
Stent Concept - cont'd.

To prevent shortening of the stent during expansion, longitudinally oriented bars between the hoops could be used. The bars should be stiff enough to prevent the shortening tendency caused by the mesh but should restrict their motion between the hoops as little as possible.

Prototypes were made using wire but a more for better device could be made by photo-etching from a metal tube.

Several placement configurations for the cross bars are possible



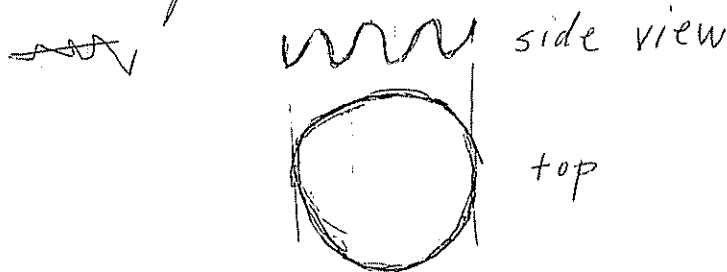
The presence of these cross bars might help support the mesh in addition to preventing any shortening. This support would ~~prevent~~ any sagging of the mesh between hoops. Another means of preventing the sagging of the mesh would be to pre-tension

March 2,
1990

Balloon Expandable Frame for "Hoop and Stacking" Stent

The following is a description of a design for the "Hoop and Stacking" stent concept.

To allow the hoops to grow in diameter it would be a possible scheme of enlarging them would be to ~~practically deform the base material~~ ~~by bending the material~~ ~~by permanently deforming the material~~ the bends would be straightened, thereby increasing the circumference, thus the diameter of the hoop. Starting with a "zig-zag" hoop and bend ~~and~~ increase.



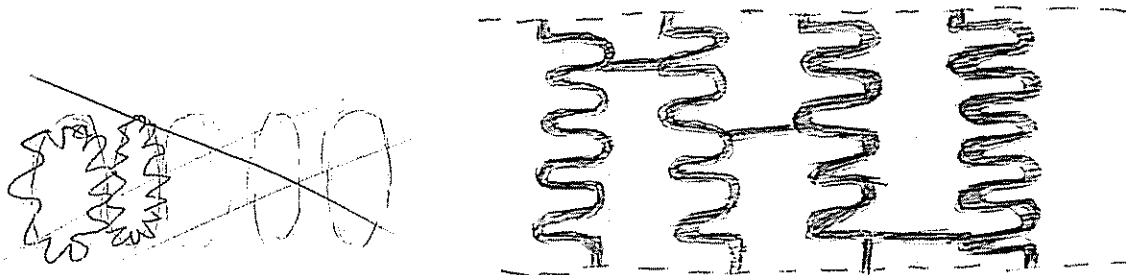
in the hoop diameter can be achieved by inflating a balloon on the inside. This would cause the zig-zags to straighten and the circumference and diameter to increase.

A stent could be constructed by using an array of these hoops to support a stretchable tube. To prevent shortening caused by the radial enlargement, interconnecting ribs can be placed between the hoops as described on page 34.

A possible method of making such a device would be to have the hoop structure photoetched from a tube.

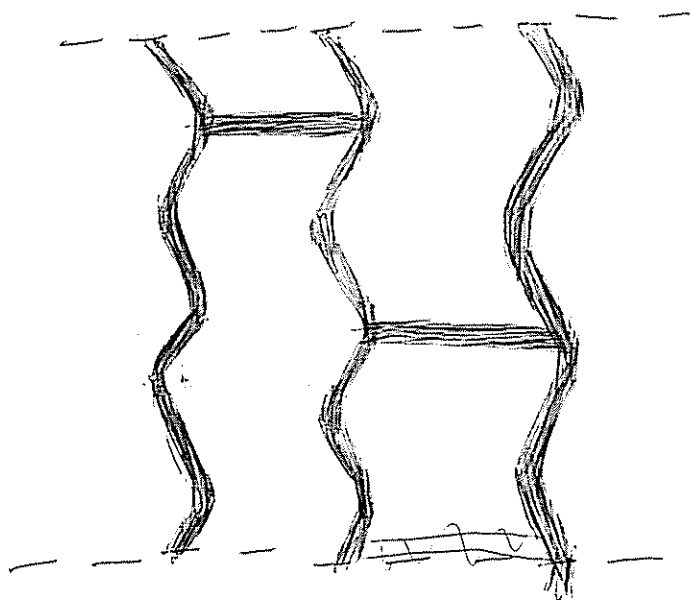
March 2,
1990

This would appear to be feasible using the method of using a CO₂ laser to ablate a pattern into photo-resist. Having done so the tube could be acid etched to create the desired structure.



sketch of pattern to be cut (shown in cut and rolled flat form).

when expanded the pattern would appear to be less wavy.



Timothy Lau
3/5/1990
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3/5/90